

Physics 112: Math Skills Review

1. Convert the following units:

- a. 42.3 m/s to km/h
- b. 150 km/h to m/s
- c. 13.5 m to km
- d. 155 km to m
- e. 67.4 s to h
- f. 3.5 h to s

2. Rearrange the following equations for the variables indicated:

- a. $v = \frac{\Delta d}{\Delta t}$ **$\Delta d, \Delta t$**
- b. $a = \frac{\Delta v}{\Delta t}$ **$\Delta v, \Delta t$**
- c. $a = \frac{v_f - v_i}{\Delta t}$ **$v_f, v_i, \Delta t$**
- d. $\Delta d = v_i \Delta t + \frac{1}{2} a t^2$ **v_i, a**
- e. $v_f^2 = v_i^2 + 2ad$ **v_i, a, d**
- f. $F_{net} = ma$ **m, a**
- g. $F_g = mg$ **m, g**
- h. $F_f = \mu F_N$ **μ, F_N**
- i. $F_{gy} = mg \cos \theta$ **$g, \cos \theta$**
- j. $F = kx$ **k, x**
- k. $F \Delta t = mv_2 - mv_1$ **m, F**
- l. $E_e = \frac{1}{2} kx^2$ **k, x**

3. Graphing

- Create a graph for the following sets of data, and draw a line of best fit for each.
- Find the slope of each line - include units, and the correct sig digs.

Remember when graphing:

- Use a pencil
- Use a full page
- Mark data points with tiny x's
- Make a clear scale
- Label the axes
- Extrapolate

1. Speed of a dragster

Time from Start (s)	Instantaneous Speed (m/s)
0.0	0.0
1.0	9.8
2.0	19.8
3.0	29.6
4.0	39.6
5.0	49.5

2. An airplane at constant velocity

Time (s)	Position (m)
0.0	100.5
1.5	360.7
2.3	620.2
3.7	880.0
4.2	1140.2
5.1	1400.0

3. Car travelling on a highway

Time (s)	Position (m)
0	0.0
1.3	25.0
2.7	50.0
3.6	75.0
5.1	100.0
5.9	125.0
7.0	150.0
8.6	175.0
10.3	200.0

